

CLAIMS

1. A turbine (30) for a hydroelectric power plant (25) intended to equip a water stream at the level of a very low head lower than 10 meters, and preferably from 1 to 5 meters, comprising a helix-shaped wheel (34), the ratio between the kinetic energy of the water flow coming out of the wheel and the potential energy of the head being smaller than 20%.

2. The turbine of claim 1, in which the diameter of the wheel (34) is greater than 3 meters.

3. The turbine of claim 1, in which the rotation speed of the wheel (34) is lower than 50 revolutions per minute.

4. The turbine of claim 1, comprising:
a carter (32) crossed by an opening (62) comprising a cylindrical portion (66), the wheel (34) comprising blades (48) arranged at the level of the cylindrical portion;
a hub (50) on which the blades (48) are assembled;
a fixed box (52), the hub being rotatably assembled on the fixed box; and
a distributor (54) upstream of the wheel with respect to the water flow and comprising profiles (56) connecting the fixed box to the carter.

5. The turbine of claim 4, in which the opening (62) comprises a converging portion (64) upstream of the cylindrical portion (66) with respect to the water flow and a diverging portion (68) downstream of the cylindrical portion with respect to the water flow, the ratio between the thickness of the carter according to the rotation axis (D) of the wheel and the wheel diameter being smaller than 0.5.

6. The turbine of claim 4, in which the distributor comprises profiles (56) distributed in a star around the fixed box (52), the turbine comprising a screen washing system upstream of the distributor (54) with respect to the water flow and comprising at least one arm (66) rotatably assembled around the fixed box (32) to drive away bulky bodies maintained against the distributor.

7. The turbine of claim 4, comprising means (100, 104, 106, 116, 120, 124) for orienting the blades (48) to adapt the turbine flow rate to the flow rate of the head and/or to close the opening (62) of the carter (32).

5 8. The turbine of claim 1, comprising a hydraulic pump (92) driven by the wheel (34).

9. A hydroelectric power plant (25) intended to equip a water stream at the level of a very low head lower than 10 meters, for example, ranging between 1 and 5 meters, comprising a turbine (30) comprising a helix-shaped wheel (34), the
10 ratio between the kinetic energy of the water flow coming out of the wheel and of the potential energy of the head being smaller than 20%.

10. The hydroelectric power plant of claim 9,
15 comprising a support (36) delimiting a flow passage in which the head is created and in which the turbine (30) is arranged, and comprising means (42, 43, 44, 45) for displacing the turbine (30) with respect to the support (36) between a first position where the turbine completely closes the passage and at least one
20 second position where the turbine partially closes the passage.